

# **Washington Mill Survey — 1986**

Series Report No. 10

--	--	--

**Prepared by**  
**David N. Larsen**  
Forest Regulation  
& Assistance

April 1990



## FOREWORD

This report presents comprehensive statistics on wood consumption and the characteristics of primary wood processing mills operating in Washington during calendar year 1986. It documents the findings of the tenth biennial survey about mill characteristics, wood flows, and the input of raw materials into the state's six wood-using industries:

- ☐ sawmills
- ☐ veneer and plywood mills
- ☐ pulp mills
- ☐ post, pole and piling mills
- ☐ shake and shingle mills
- ☐ log export operations

The 1986 statistics were compiled through a mail survey. Telephone follow-up was conducted in 1987. Firms contacted were based on an up-to-date mailing list.

Since this survey was a 100 percent canvas, no sampling error is involved.

However, in a few cases data had to be estimated based on extrapolations from previous reports. Log imports to Washington from British Columbia Crown lands are included in the out of state national forest category. In total, this report provides the best and most reliable estimate of the status of wood using industries in Washington as of 1986.

Information about individual mills or companies is confidential. Data that might reveal individual mill identity have been combined with other data to avoid disclosure.

Although not a major objective of this survey, production data were obtained to provide information on wood requirements for given levels of production and to generate residue volumes.

The text highlights some statistics presented in the tables. It also provides recent trend information for the period 1976 through 1986. Information about the hardwood industry is provided in the text since this industry is not considered separately in the appendix tables. Residue, commodity production, and wood consumption information is included in the report since this helps in tracking production and consumption trends.

## ABBREVIATIONS

bf = board feet

M = thousand

Mbf = thousand board feet, Scribner

MMbf = million board feet, Scribner

sf = square feet

Msf = thousand square feet  
3/8 inch basis

MMsf = million square feet  
3/8 inch basis

Square = hundred square feet

M sq. = thousand squares

S.W.E. = Solid wood equivalent

# CONTENTS

<b>ACKNOWLEDGEMENTS</b>	Inside front cover
<b>FOREWORD</b>	iii
<b>ABBREVIATIONS</b>	iv
<b>Report Review</b>	xi
Comparison of Past Years	xiii
1984-1986 in Review	xiii
1976-1986 in Review	xiv
<b>Table Number Cross Index (Table 2)</b> (Between the ten Washington Mill Survey Reports)	xxviii
<b>Industry Overview</b>	1
1986 Highlights	3
The Timber Economy	5
Industry Characteristics	8
Residues	12
Hardwood Industry	13
Mills Using Hardwood	13
Wood Consumption	14
Hardwood Supply	16
Ownership	17
<b>Appendix A</b>	
Measurement Units	A-3
<b>Appendix B</b>	
Mill Residues	B-3
<b>Appendix C</b>	
Computer Program Used for This Report	C-3
<b>Appendix D</b>	
<b>WASHINGTON SUMMARY</b>	
D-1 Number of Mills by Timber Industry	D-3
D-2 Primary Wood Consumption	D-4
D-3 Log Use by Industry and Origin	D-5
D-4 Log Consumption by County and Harvest Origin by County	D-6
D-5 Log Use From National Forests	D-10
D-6 Number of Mills Dependent Upon Ownerships	D-11
D-7 Log Consumption by Ownership	D-12
D-8 Log Consumption by Species	D-13
D-9 Production and Disposition of Wood and Bark Residues	D-14
D-10 Log Consumption by Timber Age	D-16

---

## SAWMILLS

D-11	Number of Sawmills by Mill Size-Class	D-17
D-12	Installed Eight-Hour Single-Shift Capacity, Daily Basis	D-18
D-13	Number of Sawmills With Selected Equipment by Mill Size-Class	D-19
D-14	Number of Sawmills with Selected Equipment by County	D-20
D-15	Number of Sawmills by Headrig Type and Size	D-21
D-16	Number of Sawmills by Tenure of Present Ownership by Site Occupancy	D-22
D-17	Average Number of Operating Days	D-23
D-18	Type of Wood Consumed	D-24
D-19	Age of Logs Consumed by Mill Size-Class	D-25
D-20	Age of Logs Consumed by County	D-26
D-21	Log Inventory Changes, Log Consumption, and Apparent Log Receipts	D-27
D-22	Ownership Origin of Logs by Mill Size	D-28
D-23	Ownership Origin of Logs Consumed by County	D-29
D-24	Number of Mills Dependent Upon Ownerships	D-30
D-25	Log Consumption by Species, by Mill Size-Class	D-32
D-26	Log Consumption by Species, by County	D-33
D-27	Production and Disposition of Wood and Bark Residues by Mill Size-Class	D-34
D-28	Production and Disposition of Wood Residues by Mill Size-Class	D-36
D-29	Production and Disposition of Bark Residues by Mill Size-Class	D-40
D-30	Production and Disposition of Wood and Bark Residues by County	D-41
D-31	Production and Disposition of Wood Residues by Mill County.	D-42
D-32	Production and Disposition of Bark Residues by County	D-45
D-33	Degree of Lumber Manufacture	D-46
D-34	Lumber Production by Headrig Type, by Mill Size-Class	D-47
D-35	Lumber Production by Headrig Type, by County	D-48

## VENEER AND PLYWOOD MILLS

D-36	Number of Veneer and Plywood Mills	D-50
D-37	Installed Eight-Hour Single-Shift Capacity	D-51
D-38	Number of Mills by Lathe Log Diameter Limit	D-52
D-39	Number of Mills by Minimum Core Size Produced	D-52
D-40	Number of Mills Having Selected Equipment	D-53
D-41	Number of Mills by Tenure of Present Ownership	D-54
D-42	Average Number of Operating Days	D-55
D-43	Log Inventory Changes, Log Consumption and Apparent Log Receipts	D-55
D-44	Production and Disposition of Wood Residues	D-56
D-45	Veneer and Plywood Production	D-57

## PULP MILLS

D-46	Number of Pulp Mills	D-58
D-47	Installed Capacity by Type of Mill	D-59
D-48	Number of Mills by Tenure of Present Ownership	D-60

D-49	Average Number of Operating Days	D-60
D-50	Mill Production by Product and Operation	D-61
D-51	Type of Wood Consumed	D-62
D-52	Roundwood and Chip Consumption	D-64
D-53	Residue and Off-Site Roundwood Chip Consumption by State or Province	D-65

#### **SHAKE AND SHINGLE MILLS**

D-54	Number of Shake and Shingle Mills and Their Operating Characteristics	D-66
D-55	Number of Shake and Shingle Mills with Selected Equipment	D-67
D-56	Number of Shake and Shingle Mills by Tenure of Present Ownership and Site Occupancy	D-68
D-57	Type of Wood Consumed	D-69
D-58	Ownership Origin of Logs Consumed	D-70
D-59	Production and Disposition of Wood and Bark Residues	D-71
D-60	Production and Disposition of Wood Residues	D-72
D-61	Production and Disposition of Bark Residues	D-74
D-62	Mill Production by Product Type	D-75

#### **POST, POLE AND PILING MILLS**

D-63	Number of Post, Pole and Piling Mills and Their Operating Characteristics	D-76
D-64	Number of Post, Pole and Piling Mills by Tenure of Present Ownership and Site Occupancy	D-77
D-65	Number of Post, Pole and Piling Mills with Selected Equipment	D-78
D-66	Log Consumption by Timber Age	D-79
D-67	Mill Production	D-80

#### **LOG EXPORT OPERATIONS**

D-68	Number of Export Operations and Type of Logs Exported	D-81
D-69	Number of Export Operations by Years of Port Use	D-82
D-70	Log Flows to Ports	D-83
D-71	Log Consumption	D-84
D-72	Ownership Origin of Logs Consumed	D-85

#### **Appendix E**

Mill Directory	E-1
Sawmills	E-1
Shake and Shingle	E-3
Veneer and Plywood	E-5
Pulp Mills	E-5
Post, Pole and Piling Mills	E-6
Log Exporters	E-6

---

## LIST OF FIGURES

Figure 1: Output of Major Timber Products for Washington	7
Figure 2: Washington Log Consumption	7
Figure 3: The Five Economic Areas Encompassing 39 Counties	8
Figure 4: Log Consumption by Type of Industry	9
Figure 5: Relative and Absolute Residue Volume	13

## LIST OF TABLES

Table 1: Number of Operations Included in the Surveys	xiii
Table 2: Table Number Cross Index	xxviii
Table 3: Mill by Type and Single Shift Capacity	3
Table 4: Roundwood Use by Industry	4
Table 5: Wood and Bark Residue Production by Mill Type	5
Table 6: Log Supply by Owner Source	10
Table 7: Log Flows Measured from National Forests	10
Table 8: Dependence for Timber Supply	11
Table 9: Wood Residue Use by Industry	12
Table 10: Number of Mills and Dependency on Hardwood	14
Table 11: Hardwood Consumption	15
Table 12: Hardwood Volume by County	16
Table 13: Sawmill Hardwood Log Consumption: Mills 90% Dependent on Hardwoods	17



---



# **Report Review Comparison of Past Years**



## Report Review Comparison of Past Years

---

This section of the report reviews the Washington wood products industry during the past ten years. First the number of milling operations is reported by year for the six surveys conducted. This is followed by a brief discussion of the 1984-86 period. Then a ten-year review is provided.

**Table 1**  
**Number of Operations**  
**Included in the Surveys\***

---

	1976	1978	1980	1982	1984	1986
Sawmills	175	182	208	169	150	117
Veneer and plywood	36	36	34	27	28	26
Pulp	26	26	23	21	20	20
Shake and shingle	252	337	267	195	131	117
Post, pole and piling	22	23	21	13	11	13
Log export	<u>81</u>	<u>160</u>	<u>134</u>	<u>124</u>	<u>102</u>	<u>101</u>
Totals	592	764	687	549	442	394

---

\* Only primary wood processing mills and log export operations that operated during the survey year are included.

---

### 1984-1986 IN REVIEW

The total number of operations in the forest products industry decreased 11 percent from 1984 to 1986. By percent, the post, pole and piling sector increased 18; shake and shingle dropped 10; veneer and plywood decreased 7; and sawmills decreased 22. All sectors declined except post, pole and piling.

The lumber sector has shown a 5 percent increase in roundwood consumption from 1984 to 1986. Lumber production increased 4 percent.

The log export sector share of total log consumption declined from 39 percent in 1984 to 37 percent in 1986. Log export volume decreased from 2.3 billion in 1984 to 2.2 billion board feet Scribner in 1986 (a 4.3 percent decrease).

Douglas fir accounted for 46 percent of the harvest volume in 1986, the same percent as in 1984. Douglas fir increased as a percent of log export log consumption from 48 to 52 percent of the volume exported from 1984 to 1986.

Those mills more than two-thirds dependent on a single ownership class for log supply decreased from 272 in 1984 to 216 in 1986. The percent of all operating mills more than two-thirds dependent on a single owner class, however, declined only from 62 percent in 1984 to 55 percent in 1986. Mills more than two-thirds dependent on public ownership increased 12 percent; private ownership decreased 35 percent.

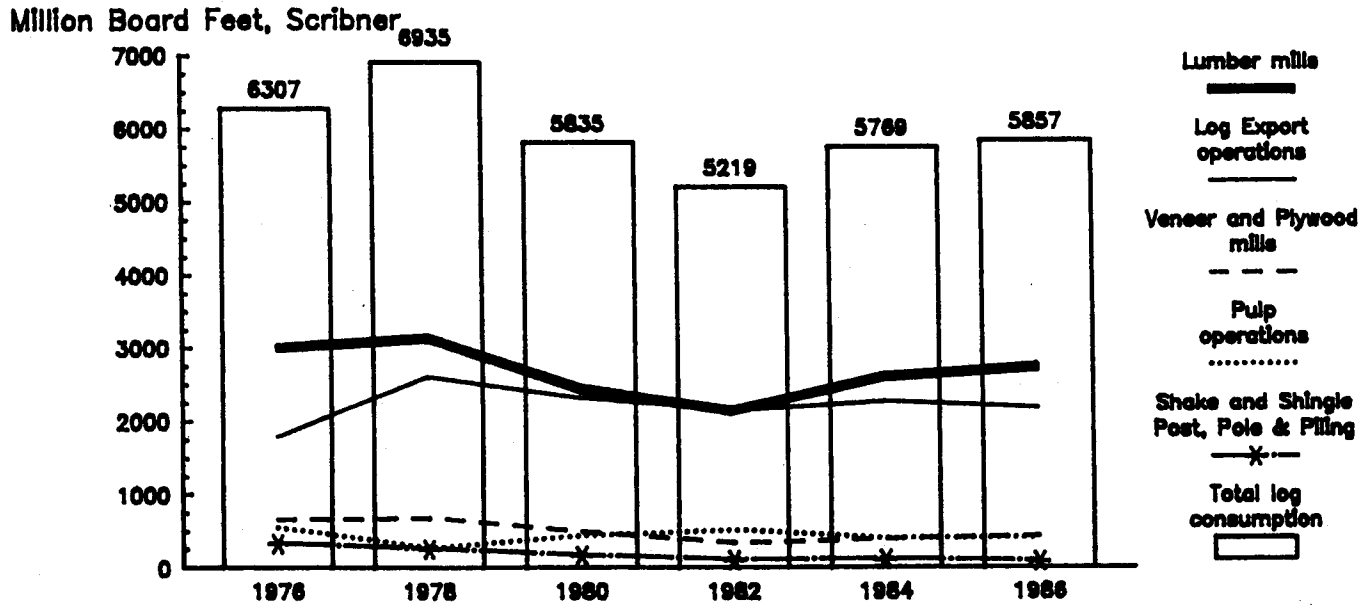
Total residue volume increased from 5.4 million tons in 1984 to 5.7 million tons in 1986. Residue use also increased, going from 5.3 million tons in 1984 to 5.6 million tons in 1986. The percent of wood and bark residues being used remained the same in 1986 as in 1984 at 98 percent. The lumber sector decreased use slightly to 98.2 percent. The veneer and plywood sector use level slightly exceeded 99.6 percent. The shake and shingle industry continues to lag substantially behind with the use of residues at 55 percent.

#### 1976-1986 IN REVIEW

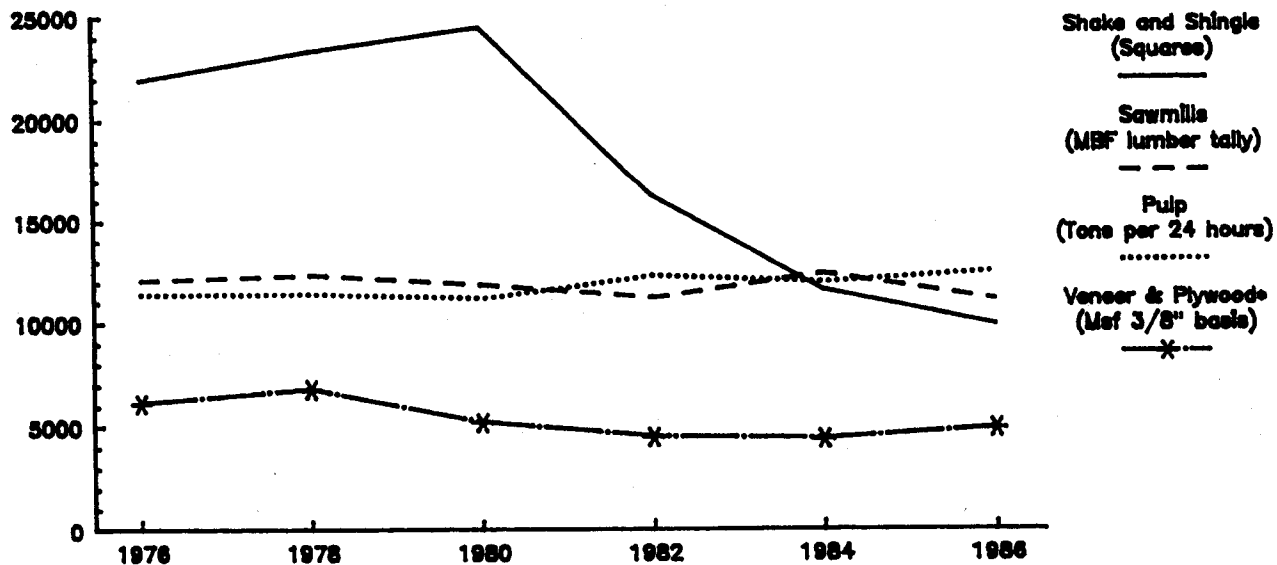
This section compares data developed from the 1976, 1978, 1980, 1982, 1984 and 1986 surveys. During this period the forest industry has undergone substantial change. Consumption peaked at 6.9 billion board feet in 1978 and was at its low at 5.2 billion board feet in 1982. The lumber industry has followed the same cycle and is the primary consumer of logs, although slightly exceeded by log export during the 1982 recession. The sawmilling and log export sectors together have accounted for over four-fifths of the log consumption for the years 1978, 1980, 1982, 1984 and 1986. In 1976 they accounted for over three-fourths.

Installed shift capacity has fluctuated over time. For the lumber sector it peaked at 12.4 thousand board feet per eight-hour shift in 1984 and has declined 10 percent to 11.2 thousand in 1986. The pulp industry has reached a new high for 24-hour capacity at 12,558 bone dry tons. For the veneer and plywood industry, the ten-year capacity high was in 1978 at 6.8 million square feet (3/8" basis) eight-hour shift capacity and for 1986 it is 5.0 million square feet, a one-fourth drop in capacity. The shake and shingle industry has sustained a major decline in capacity. In 1980 the capacity was at 24.5 thousand squares. It has declined to 9.9 thousand squares as of 1986, a capacity decline of over half. This is an industry which greatly depends on the use of old growth western redcedar and is expected to continue to decline because of this.

## Total Log Consumption by Year and Industry



## Installed Shift Capacity



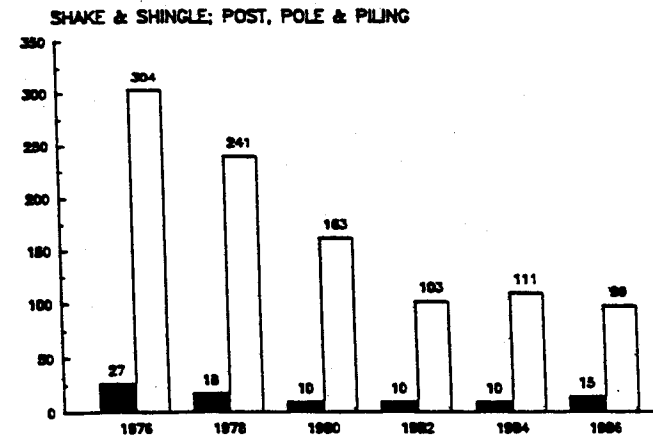
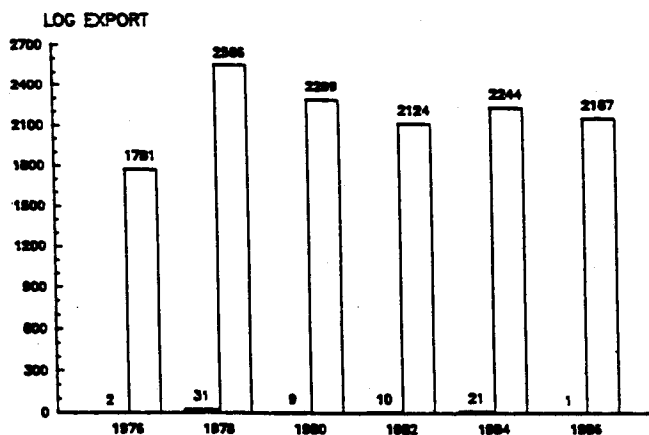
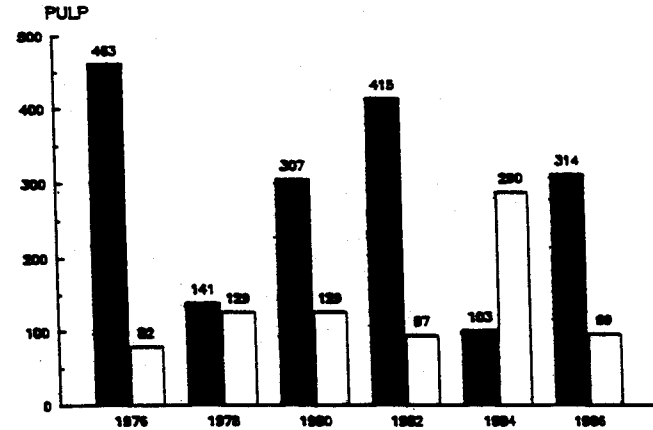
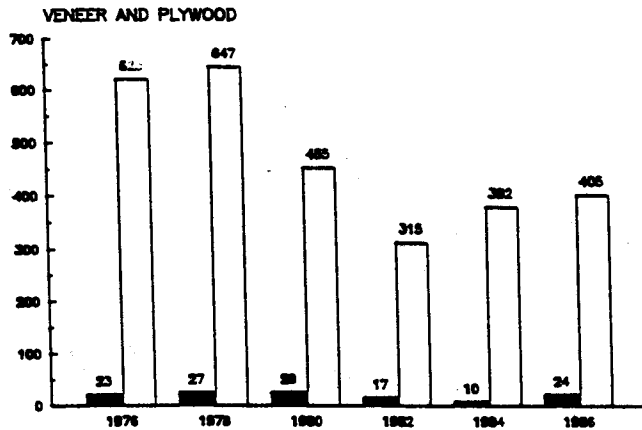
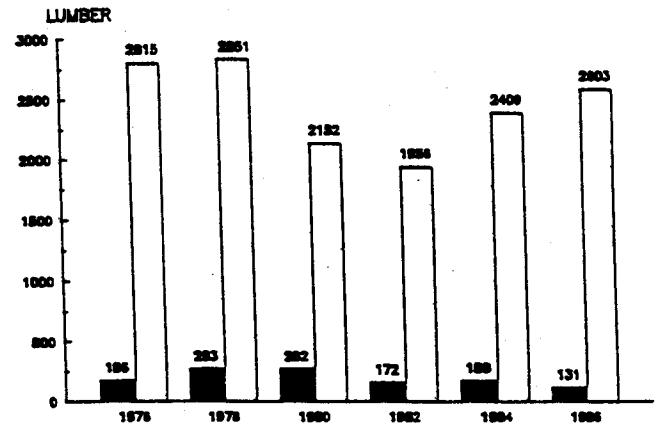
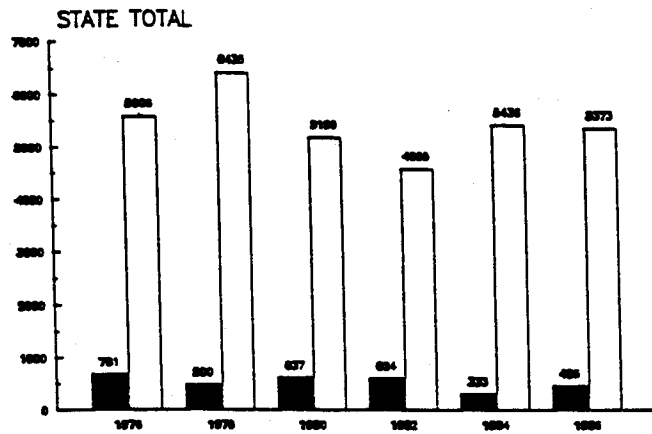
\*Capacity includes total capacity for veneer-only and layup-only operations, but only the veneer in the veneer and layup plants.

## **Note**

Roundwood consumption comparing sound and utility grades are shown in total and by sector. The pulp industry is the primary utility log user. Very little utility grade is exported.



# Roundwood Consumption of Sound and Utility Logs (Million board feet, Scribner)



Utility logs

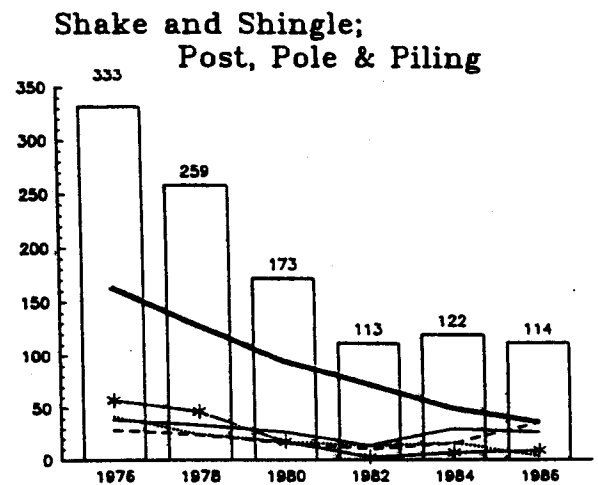
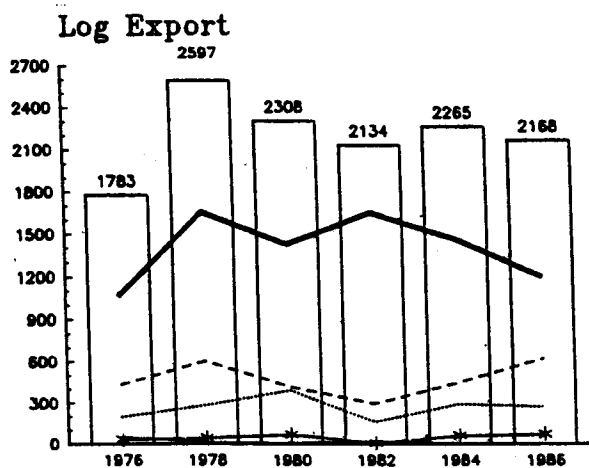
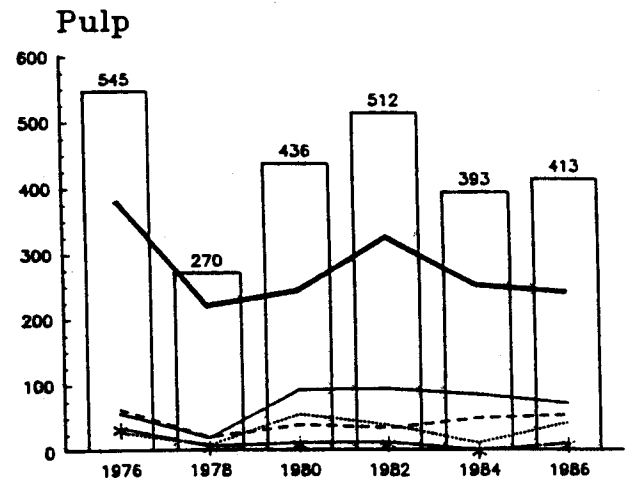
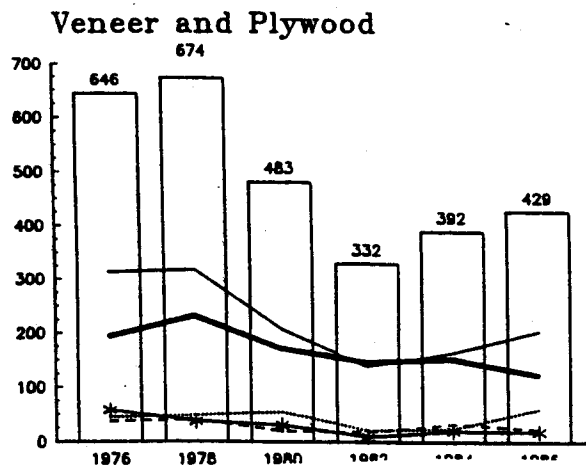
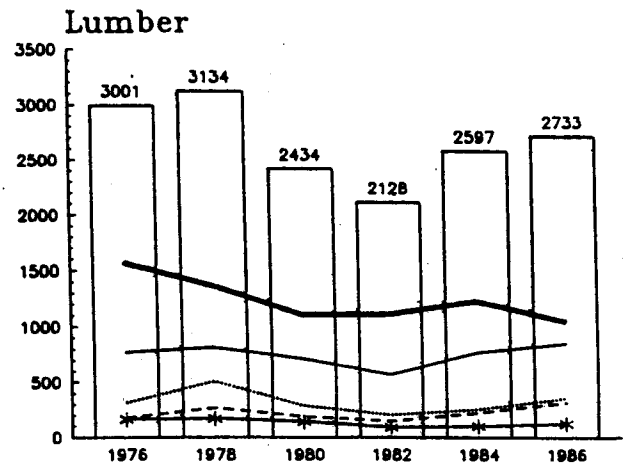
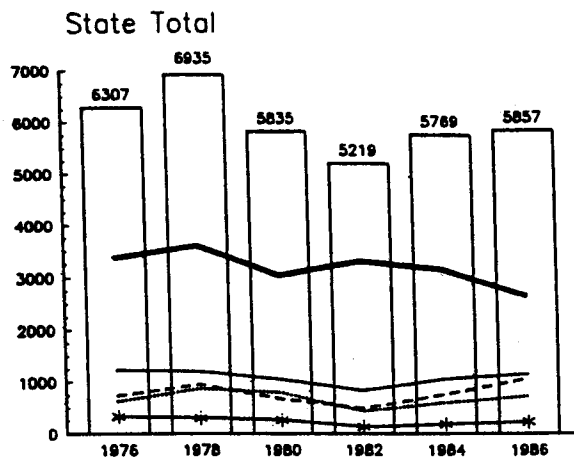
Sound logs

NOTE: Scale for height of bar is different for each industry.  
Hence direct comparison among the different industries  
is not valid.

## **Note**

Log consumption by owner class shows that forest industry is the single most important owner class in total. Forest industry's contribution peaked in 1978 at 3.6 billion board feet Scribner and has since declined to 2.7 billion board feet, a decline of one-fourth. The national forests are an important source of logs for the veneer and plywood industry. In 1986 nearly half of this industry's consumption came from the national forests.

# Log Consumption by Ownership Class (Million board feet, Scribner)



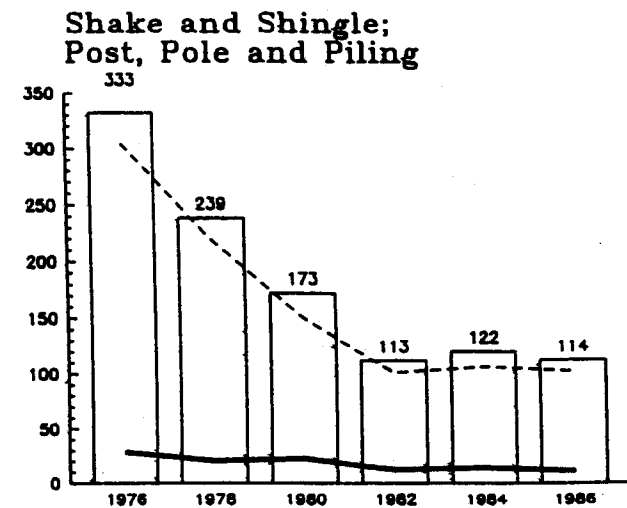
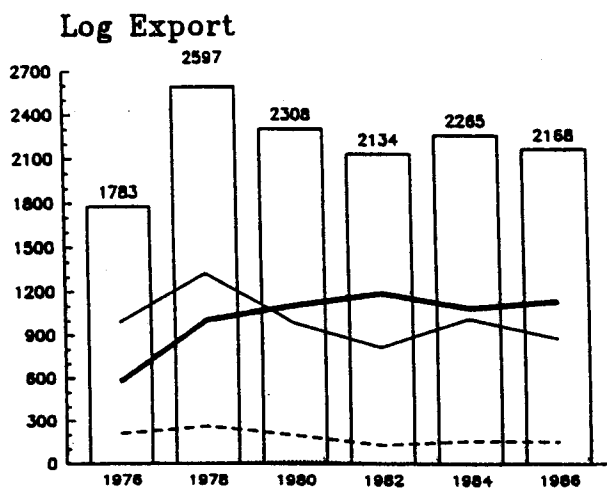
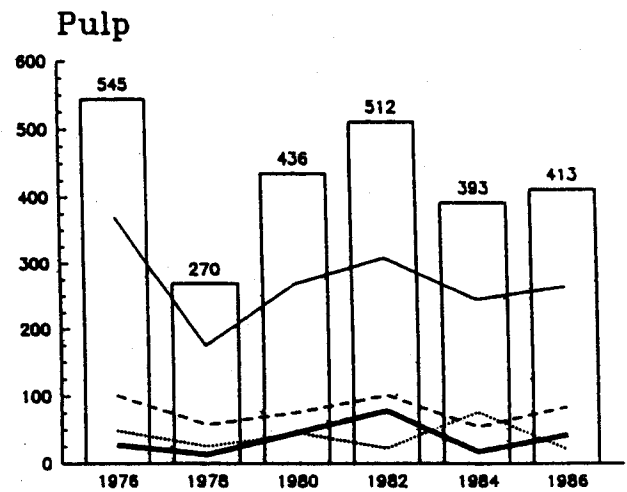
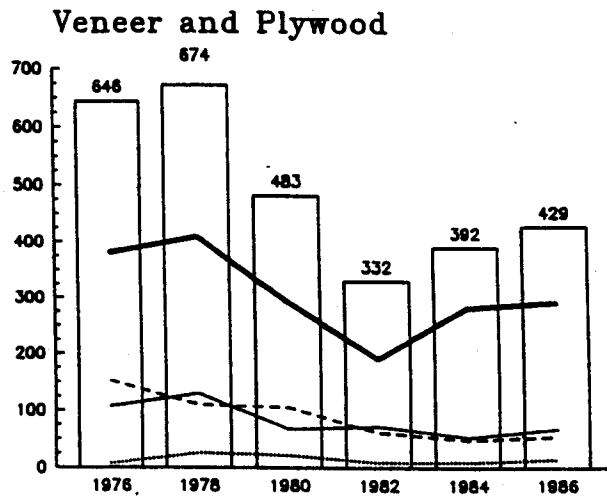
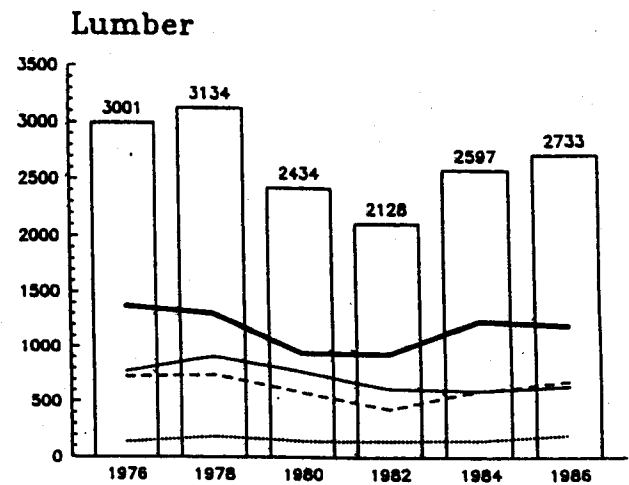
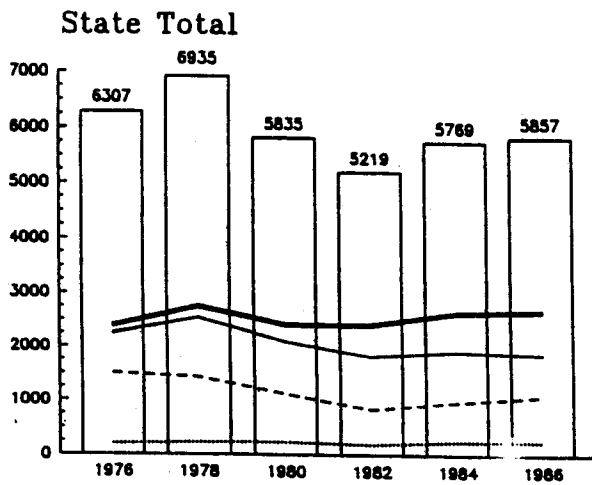
Forest Industry National Forest State Farmer & misc. private Other public Total log consumption

## **Note**

---

Douglas fir was the most important single species throughout the 10-year period. Hemlock has been a strong second place species. Douglas fir has been the dominant species for the lumber and the veneer and plywood industries. Hemlock has dominated the pulp industry. Western redcedar has been the primary species for the shake and shingle industry. For the log export market, hemlock was first in the 1970s, but Douglas fir has been first since 1980.

## Log Consumption by Species (Million board feet, Scribner)



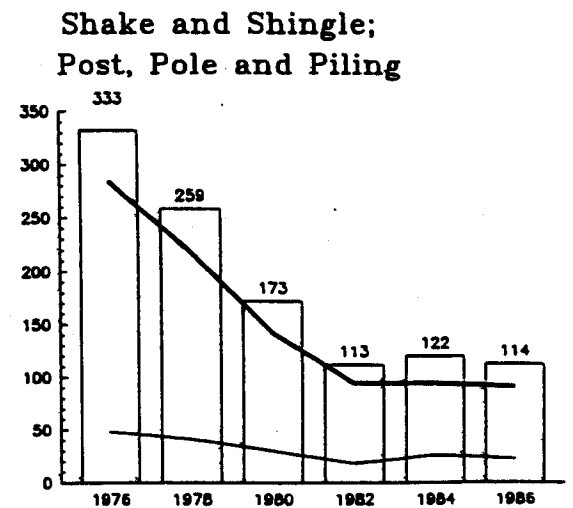
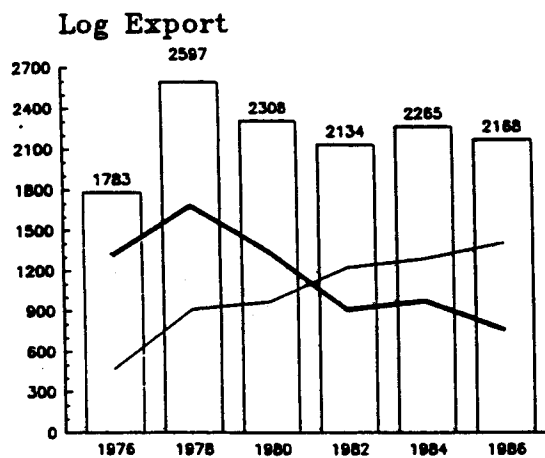
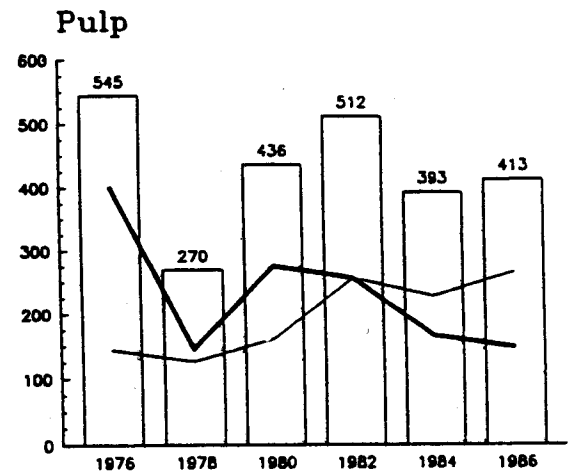
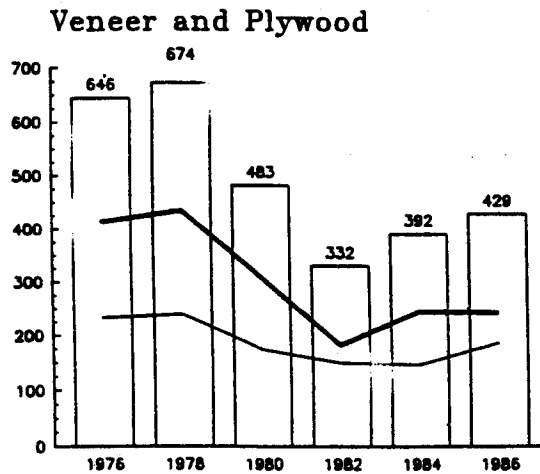
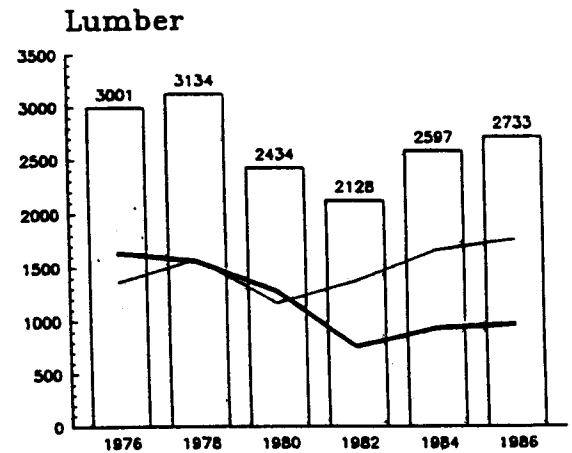
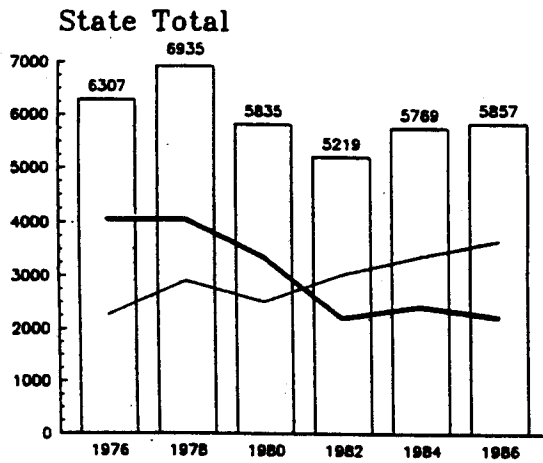
Douglas fir   Hemlock   Other softwoods   Hardwoods   Total log consumption  
 —————   ————   - - - -   .....   [Bar]

## **Note**

---

Timber over 100 years of age was the dominant age class through 1980. With the old growth timber a declining resource, young growth timber has become more important. This is a trend which will continue because of current forest management silvicultural practices. Timber stand rotations are usually much shorter than 100 years.

## Log Consumption by Timber Age Group (Million board feet, Scribner)



Old Growth (100+ years)   
 Young growth (less than 100 yrs.)   
 Total log consumption

## **Note**

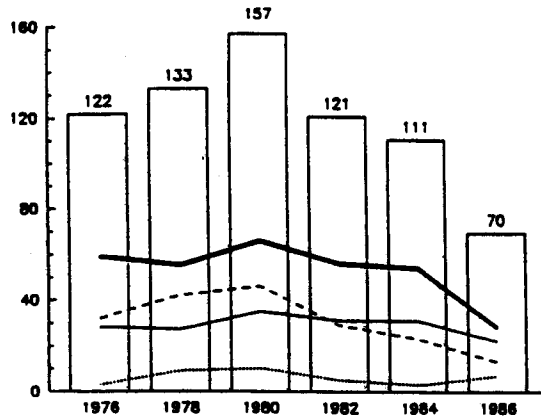
---

Mill dependency is shown by graphing mills more than two-thirds dependent on a single ownership. Surprisingly the farmer and miscellaneous private, with 13 percent of the harvest, is the most important owner class for the lumber industry. The veneer and plywood industry depends more on national forest timber than any other ownership. Log export is dominated by the forest industry as the primary source of logs.

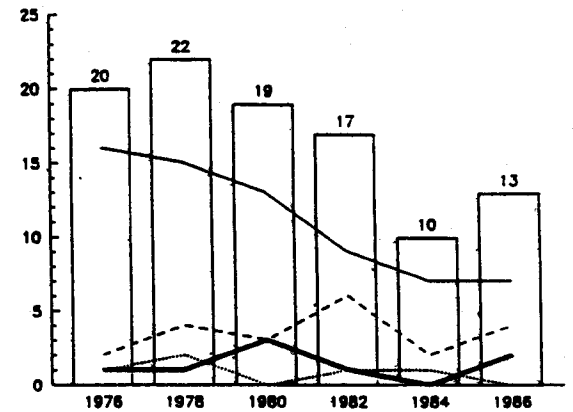


# **Number of Mills More Than Two-Thirds Dependent on a Single Ownership For Logs (Million board feet, Scribner)**

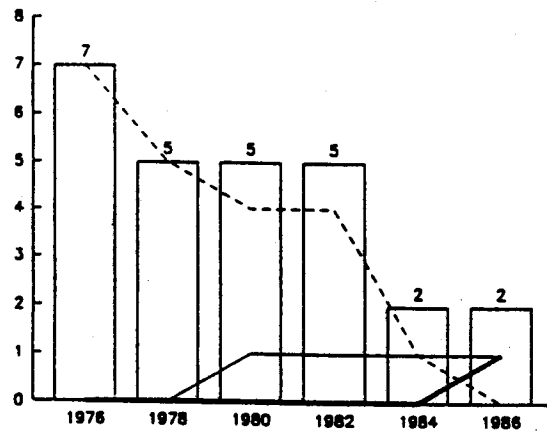
**Lumber**



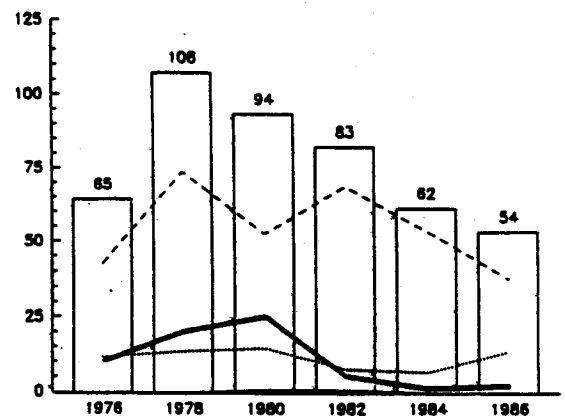
**Veneer and Plywood**



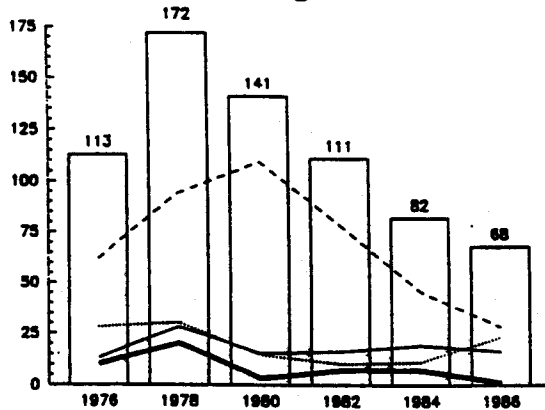
**Pulp**



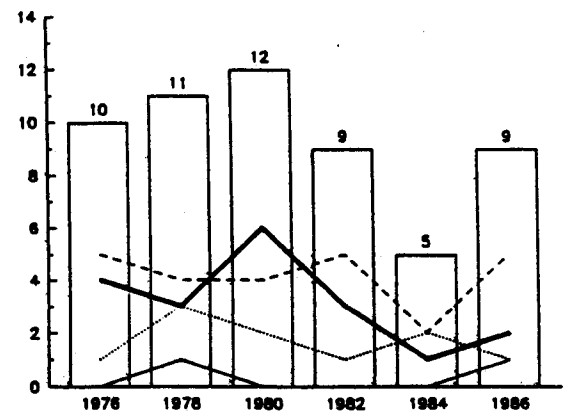
**Log Export**



**Shake and Shingle**



**Post, Pole and Piling**



Former and misc. private      National Forest      Forest Industry      State and other public      Total mills

—      - - -      . . .      —      [Bar]

## **Note**

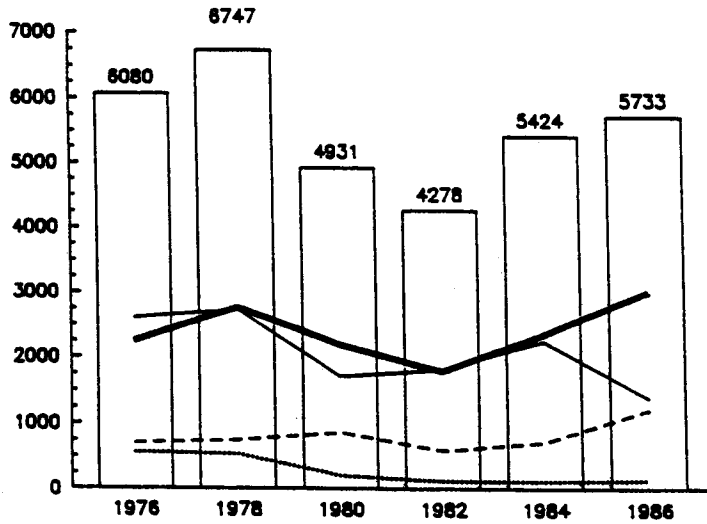
---

Residue production has fluctuated from a high of 6.7 million tons in 1978 to a low of 4.3 million tons in 1982.

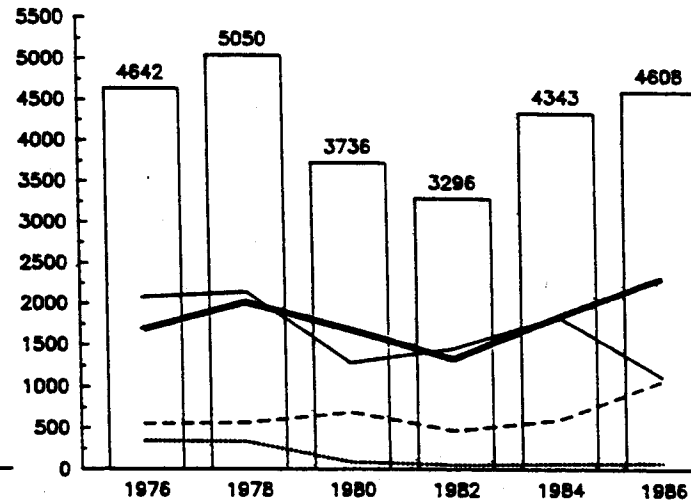
Lumber is the primary source of residues with over 80 percent of the residues produced. Fuel use has been over half the total; pulp has been second with about one-fourth of total residues.

# **Production and Disposition of Wood and Bark Residue (Million board feet, Scribner)**

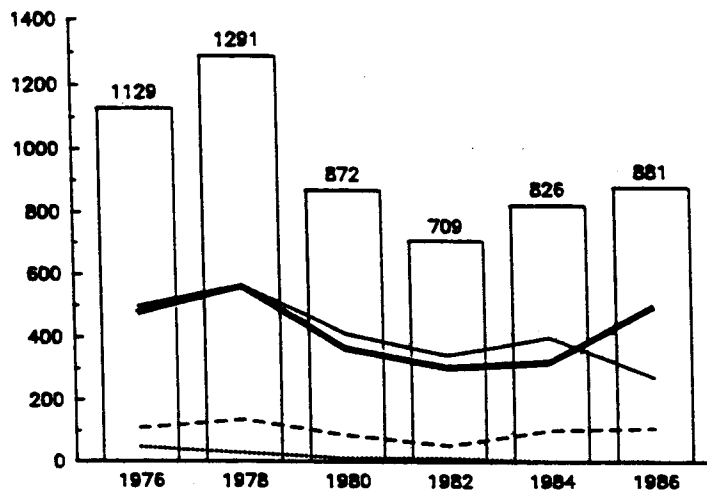
**State Total**



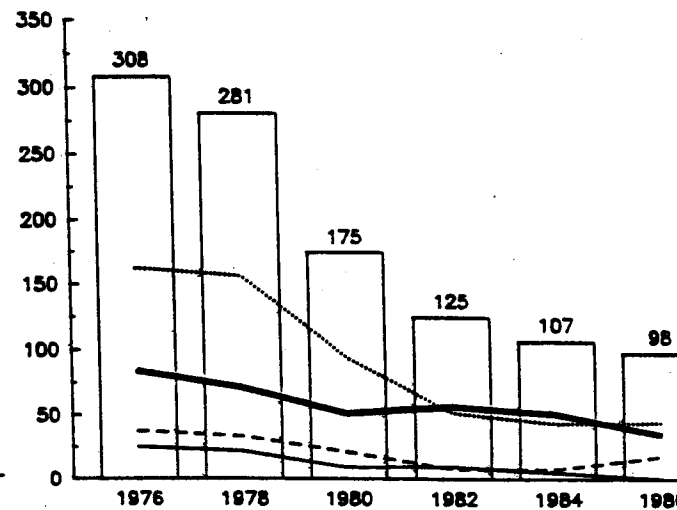
**Lumber**



**Veneer and Plywood**



**Shake and Shingle**



Total residue    Unused    Other uses    Pulp and board    Fuel

**Table 2****Table Number Cross Index**

(Between the ten Washington mill survey reports<sup>1)</sup>  
report year and table number

1978 thru 1986	1976	1974	1970 and 1972	1968
1	1	1	1	1*
2	2,26*,76*	2,25,74*	2,24,72*	2*,23,67*
3	3	3	3	3*
4	4	4	4	4
5	5	5	81	--
6	6	6,47,60,72	4,45,58,70	5,42,55,66
7	7,61,77*	7,59,70	6,57,68	19,41,54,64
8	8,76*	8,74*,75	7,72*,73	6*,67*
9	9	9	8	7
10	10,60	18,44,58,69*	17,42,56,67*	16,39,53,63*
11	11	10	9	8
12	12	11	10	9
13	13	12	11	10
14	14	13	12	11
15	15	14	13	12
16	16	15	14	12
17	17	16	15	13
18	18	17	16	15
19	19	18	17	16
20	20	19	18	17
21	21	20	19	18
22	22	21	20	19
23	23	22	21	20
24	24	23	22	21
25	25	24	23	22
26	27	26	25	24
27	28	27	26	25
28	29	28	27	26
29	30	29	27	27
30	31	30	29	28
31	32	31	31	29
32	33	32	30	30
33	34	33	32	--
34	35	34	--	--
35	36	35	--	--
36	37	36	34	31
37	38	37	35	32
38	39	38	36	34
39	40	39	37	35
40	41	40	38	33

**Table 2 (continued)**  
**Table Number Cross Index**  
 (Between the ten Washington mill survey reports<sup>1</sup>)  
 report year and table number

1982 thru 1986	1978 and 1980	1976	1974	1970 and 1972	1968
41	41	42	41	39	36
42	42	43	42	40	37
--	43	44	43	41	38
--	44	45	44	42	39
43	45	46	45	43	40
--	46	47	46	44	41
--	47	48, 49	48, 49*	46, 47*	43, 44*
--	48	50	50	48	45
44	49	51	51	49	46
--	50	52	52	50	47
45	51	53	--	--	--
46	52	54	53	51	48
47	53	55	54	52	49
48	54	56	55	53	50*
49	55	57	56	54	51
50	56	58	--	--	--
51	57	59	57	55*	52*
52	58	62	61	59	56
53	59	63	62	60	--
54	60	64	63, 64, 67	61, 62, 65	57, 58, 61
55	61	65	65*	63*	59*
56	62	66	66	64	60
57	63	67	68	66	62
58	64	68	71*	69*	65*
59	65	69	78	76	69
60	66	70	79	77	70
61	67	71	80	78	71
62	68	72	81*	79*	--
63	69	73	63, 64, 67	61, 62, 65	57, 61
64	70	74	66	64	60
65	71	75	65*	63*	59*
66	--	--	--	--	--
67	72	78	81	79	--
68	73	79	68*	66*	62*
69	74	80	66	64	60
70	75	81	--	--	--
71	76	82	73*	71*	68*
72	77	7*	70*	68*	64*
--	--	--	76	74	--
--	--	--	77	75	--
--	--	--	82	80	72

<sup>1</sup>Base year 1986

\*Contains part of same information



# Industry Overview





## 1986 HIGHLIGHTS

Mills operating in Washington in 1986 totaled 394. Analysis of single-shift capacity and number of mills by type shows:

**Table 3**  
**Mills by Type**  
**and Single Shift Capacity**

Type of <u>mill</u>	Number of <u>mills</u>	Single shift <u>capacity</u>
Sawmills	117	11.2 MMbf
Log export	101	not applicable
Veneer & plywood	26	5.0 MMsf (3/8 " basis)
Pulp	20	12.6 m tons (daily)
Shake & shingle	117	9.9 m sq.
Post, pole & piling	13	40.1 MMbf (peeling-yearly)
Total		394

Clallam County led with 61 operations.

The 41 largest sawmills (Class A) had 75 percent of the total eight-hour shift sawmilling capacity. During 1986 the Class A sawmills consumed 74 percent of the logs processed and produced 76 percent of the lumber manufactured.

### Wood Consumption

0 5.9 billion board feet of roundwood logs were consumed by the industry. Sawmills accounted for nearly half the volume. Log export took over one-third. These two sectors account for 84 percent of the consumption.

0 18 million board feet (log scale) of peeler cores, cants, blocks, bolts and miscellaneous peeled products were consumed.

0 7.1 million tons of chips, sawdust and shavings were consumed by the pulp industry.

**Table 4**  
**Roundwood Use by Industry**

<u>Industry</u>	<u>Volume</u> (MMbf)	<u>Percent</u>
Sawmills	2,733	47
Log export	2,168	37
Veneer & plywood	429	7
Pulp	413	7
Shake & shingle	93	2
Post, pole & piling	<u>21</u>	<u>&lt;.5</u>
Total	5,857	100

Leading counties in roundwood use were:

Grays Harbor/Jefferson/Pacific\* . . 882 MMbf  
 Cowlitz . . . . . 825 MMbf  
 Snohomish . . . . . 651 MMbf  
 Pierce. . . . . 628 MMbf

\*Combined to avoid disclosure.

- ☐ 90 percent of total wood used by the pulp sector was in the form of chips, sawdust, shavings, and waste paper.
- ☐ 92 percent of all log volume used was from sound logs.
- ☐ 46 percent of roundwood volume was Douglas fir; 32 percent hemlock; 6 percent ponderosa pine and 6 percent western redcedar.
- ☐ 3.2 percent of all log volume consumed was imported; 84 percent of this volume came from Oregon.
- ☐ 45 percent of log volume came from forest industry timberlands; 20 percent from national forests; 18 percent from state-managed lands.
- ☐ 68 percent of national forest log volume statewide came from combined harvests on the Gifford Pinchot, Mt. Baker-Snoqualmie, and Olympic National Forests; 31 percent from Gifford Pinchot; 22 percent from Mt. Baker-Snoqualmie, and 14 percent from Olympic.

## Residues

□ 5.7 million tons of wood and bark residues were generated. The sources by sector are shown below. Sawmills are the primary source.

**Table 5**  
**Wood and Bark**  
**Residue Production by Mill**  
**Type**

Type of <u>mill</u>	Million <u>tons</u>	<u>Percent</u>
Sawmills	4.6	81
Veneer & plywood	0.9	15
Shake & shingle	0.1	2
Other*	<u>0.1</u>	<u>2</u>
Total	5.7	100

\* Other includes log export and post, pole and piling.

□ 76 percent of residue was wood; 24 percent was bark. 98 percent of wood residues and 97 percent of the bark were used. Unused were 133,612 tons of wood and bark.

□ 47 percent of wood residue went for fuel; 31 percent to the pulp sector; 20 percent other uses; 2 percent was unused.

## THE TIMBER ECONOMY

The Washington timber economy continues to adapt to a changing economic climate. Although the number of processing operations has declined by about 10 percent from 1984 to 1986, log consumption is up 2 percent. Washington still remains one of the leading timber industry states, producing 11 percent of the nation's softwood lumber, 7 percent of the nation's softwood plywood, and providing 62 percent of the nation's softwood log exports.

The forest industry has become more efficient in terms of labor input. While log consumption rose, total employment in the forest industry (SIC 24 and 26)<sup>1</sup> declined from 56.7 thousand in 1984 to 54.4 thousand in 1986. In the forest industry, however, the pulp and paper industry (SIC 26) increased employment from 16.1 thousand in 1984 to 16.8 thousand in 1986.

Washington's total timber harvest for 1986 was 6.5 billion board feet<sup>2</sup> (Figure 1). This is up 9 percent from 1985 and up 12 percent from 1984. The mill survey for 1986 shows log consumption at 5.9 billion board feet. This is about 10 percent lower than the harvest. This difference may be attributed to several factors. Nearly 2 million tons of chips went from roundwood chipping mills to the pulp mills. This volume was not included as roundwood in the mill survey. It converts to about one billion board feet Scribner. Other plausible contributing factors: logs being exported to other states and not being included in the survey process (only final consumers are surveyed), some mills were possibly missed in the survey, and possibly reported log consumption was lower than actual consumption.

The lumber, plywood and pulp information in Figure 1 is from the Washington Mill Survey series. Information for a ten-year period is shown.

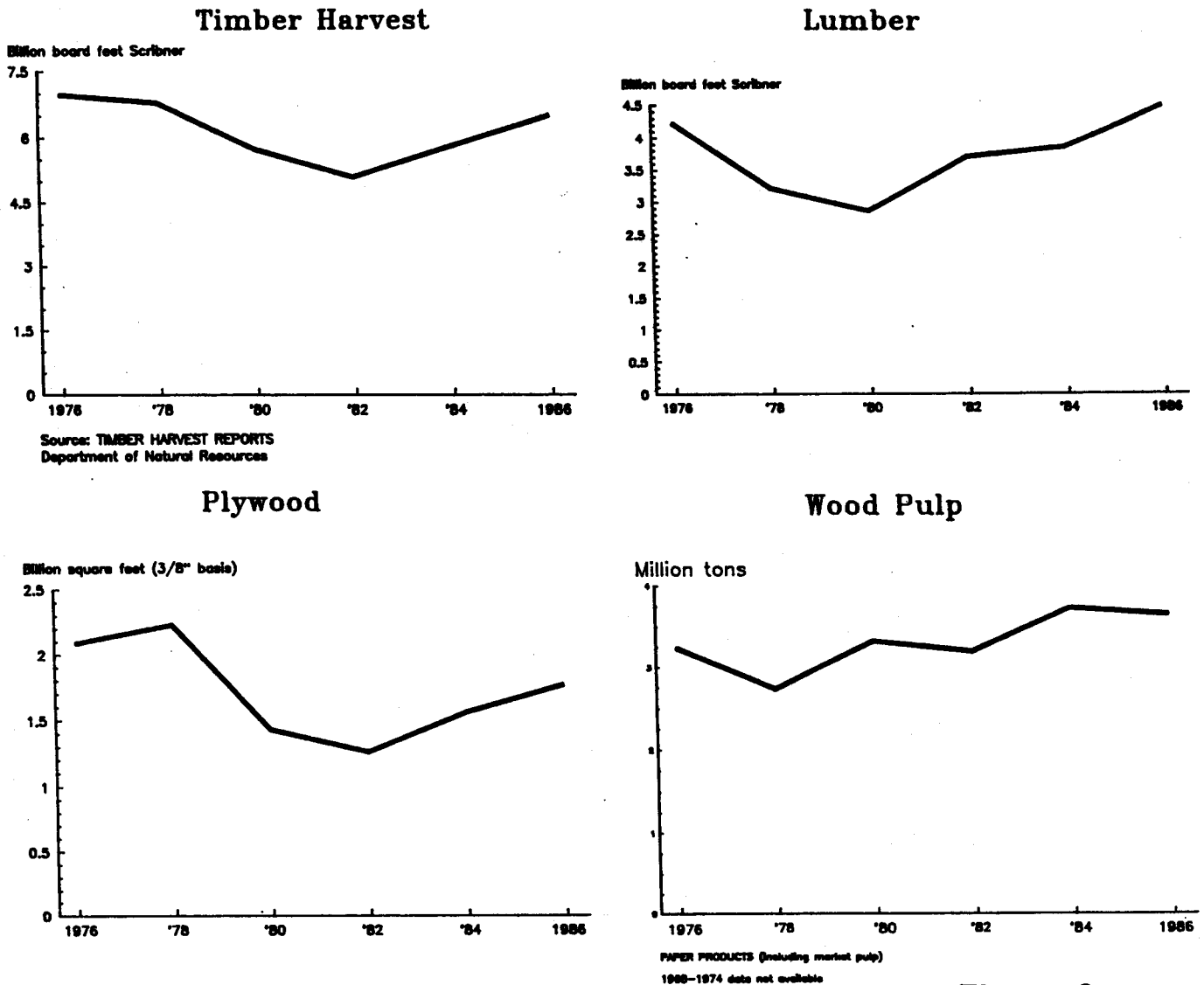
Total wood use by Washington forest industry sectors is shown in Figure 2. This information is from the Washington Mill Survey series and shows log consumption for five of the six sectors. The post, pole and piling sector is not shown due to graphics limitations. This sector only consumes about 20 million board feet (a fraction of 1 percent of all roundwood consumed). It is, however, a sector which produces high value specialty products and is a valuable part of the Washington forest products industry.

---

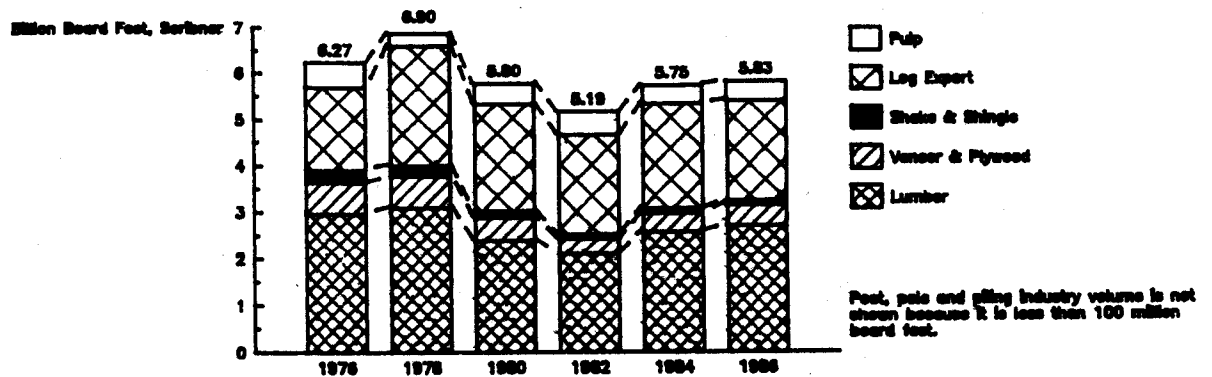
<sup>1</sup>Employment data is reported to the Employment Security Department on quarterly tax reports by employers subject to the Washington Employment Security Act. Timber industry employment (SIC 24 and 26) does not include some segments, such as longshore workers and truckers, not entirely attributable to the timber industry.

<sup>2</sup>Source: 1986 Washington timber harvest. Dept. of Nat. Res. Olympia, Wash.

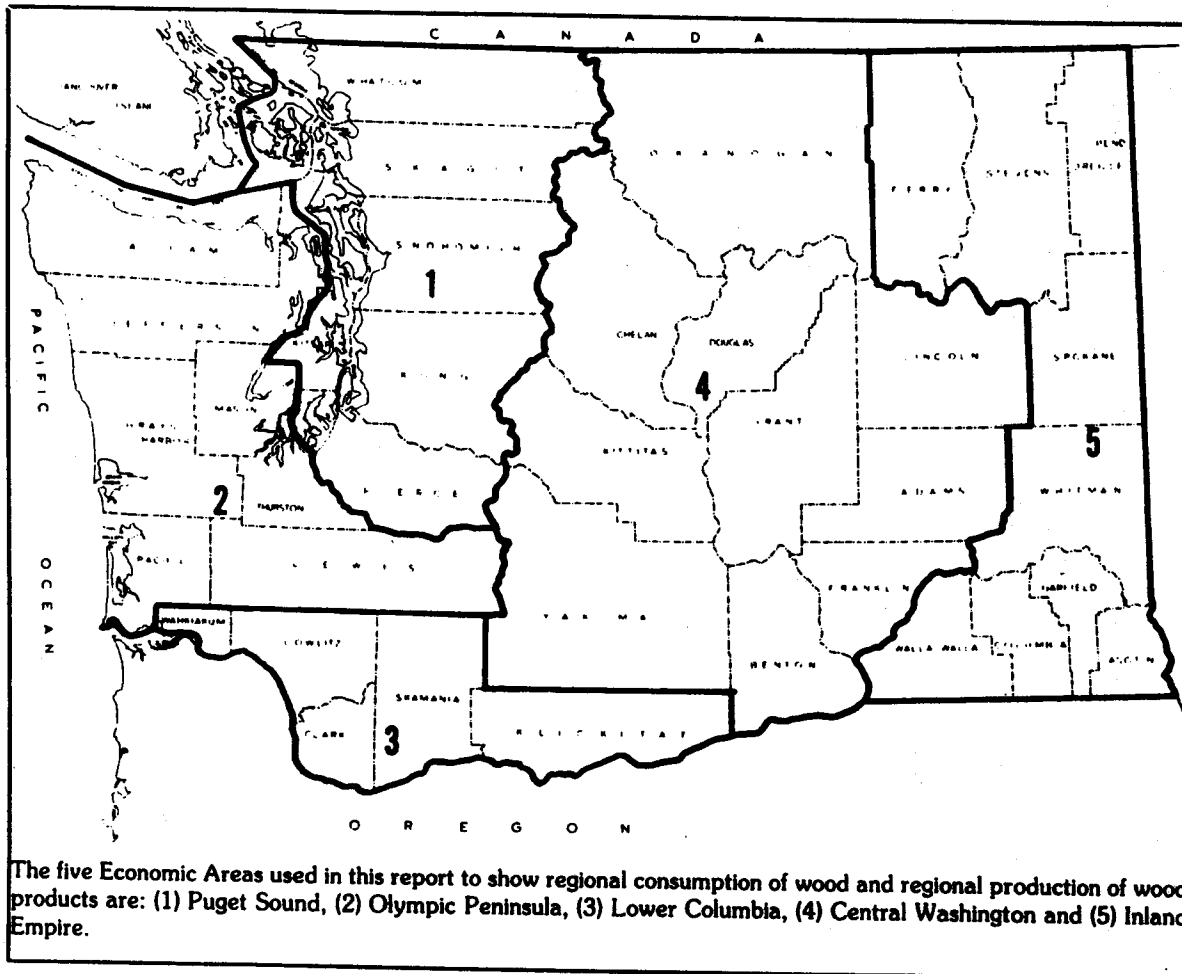
**Figure 1**  
**Output of Major Timber Products for Washington**



**Figure 2**  
**Washington Log Consumption**  
**by Major Industries**



**Figure 3**  
**The Five Economic Areas**  
**Encompassing 39 Counties**



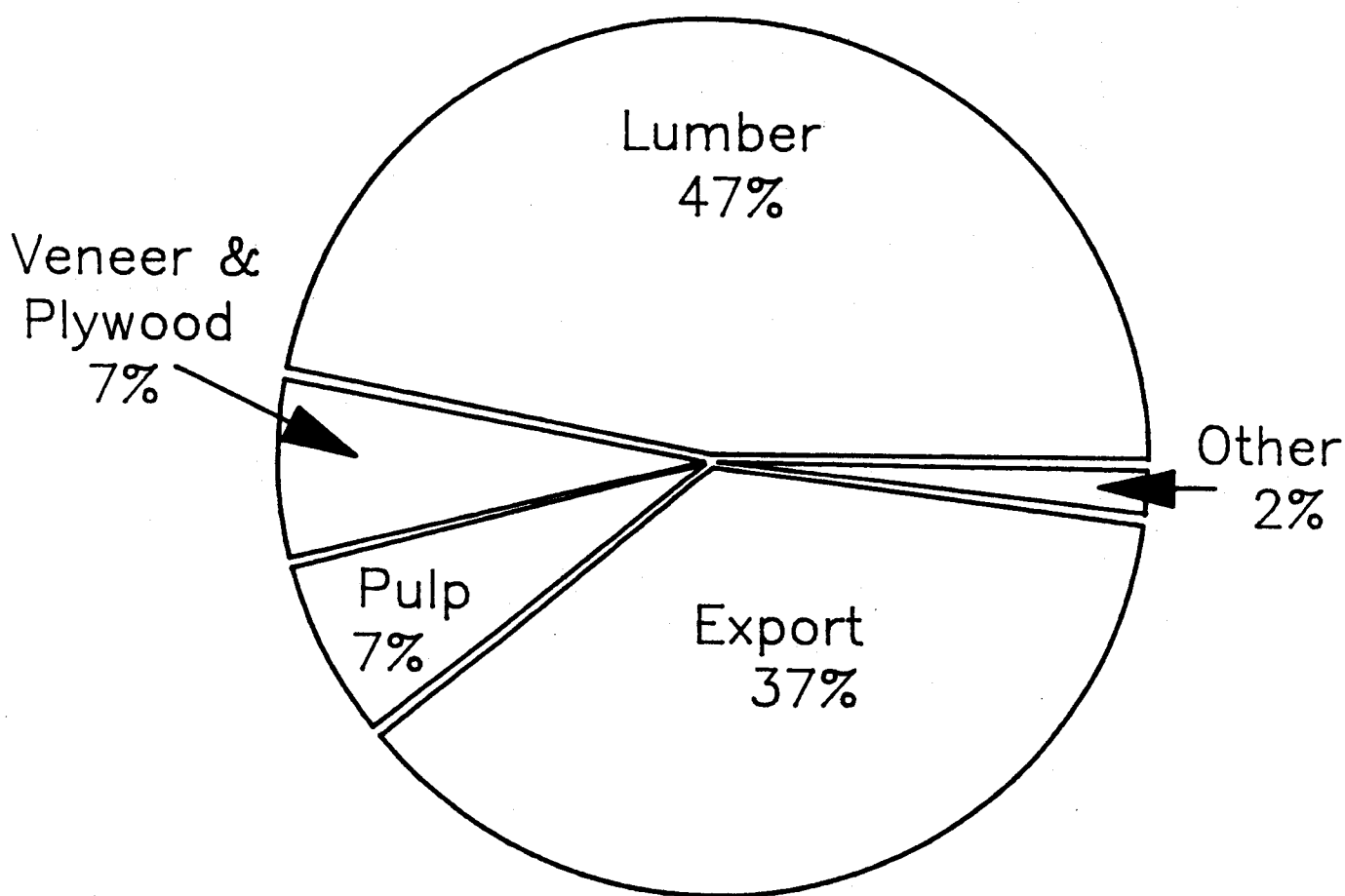
#### INDUSTRY CHARACTERISTICS

The industry is divided into six segments in this report: lumber; veneer and plywood; pulp; log export; shake and shingle; and post, pole and piling. Each sector is unique in its raw material requirements, production methods, and marketing procedures. Efforts have been made to present data for each industry sector independently where data was sufficient to avoid disclosure of confidential information from individual operations. Counties which had fewer than three operations were combined with others. Economic areas are illustrated in Figure 3. In all cases data were grouped to maximize the identity of geographic origin. Where possible, these groupings have remained the same as those used in previous surveys to allow comparison. Comparisons between sectors and economic areas can be obtained by using Tables D-1 to D-10 in Appendix D.

### Wood Consumption

During 1986, Washington's primary forest products industries consumed 5.9 billion board feet of logs, 18 million board feet of other wood and 7 million tons of chips and wood residue. Sound logs comprised 92 percent of the total roundwood: sawmills consumed 48 percent; log export accounted for 40 percent. Utility and cull logs accounted for 8 percent of total roundwood with the pulp industry consuming 65 percent of these materials. Figure 4 illustrates the total log consumption by industry sector.

**Figure 4**  
**Log Consumption by Type of Industry**



The 7 million tons of chips and residues consumed by the pulp industry consisted of mill residues and material from roundwood chipping plants as well as other fiber residues. This volume is equivalent to about 3.5 billion board feet of roundwood logs. Most of the chips were by-products of manufacturing operations. The forest products industries relied on several ownerships for log supplies. Yet over 45 percent of industry consumption (including log export) was met from a forest industry owning 26 percent of the commercial forest lands in the state. Industry in 1984 provided 55 percent of the consumption volume.

**Table 6**  
**Log Supply by Owner Source**

<u>Ownership</u>	<u>Log supply</u> (percent)
State	18
National forest	20
Bureau of Land Management	*
Other public	4
<hr/> Total Public	<hr/> 42
Forest industry:	
Own wood supply	18
Other wood supply	27
Farmer & misc. private	13
<hr/> Total private	<hr/> 58
 All owners	 <hr/> 100

\*Less than 0.5 percent

**Table 7**  
**Log Flows Measured From National Forests:**

<u>National Forest</u>	<u>Log flow</u> (Percent)
Gifford Pinchot	31
Mt. Baker-Snoqualmie	23
Olympic	14
Wenatchee	11
Colville	8
<hr/> Other	<hr/> 13
 All National Forests	 100



Dependence for timber supply by ownership class is determined by totaling individual mills obtaining more than two-thirds of their logs from a single ownership class. Percents are taken as a share of 394 mills in the state.

**Table 8**  
**Dependence For Timber Supply**

<u>Ownership</u>	<u>Mills over</u> <u>two-thirds dependent</u>	
	(number)	(percent)
State	40	10.2
National forest	47	11.9
Bureau of Land Management	--	--
Other public	5	1.3
<hr/> Total public	<hr/> 92	<hr/> 23.4
Forest industry:		
Own wood supply	17	4.3
Other wood supply	71	18.0
Farmer & misc. private	36	9.1
<hr/> Total private	<hr/> 124	<hr/> 31.4
<hr/> All owners	<hr/> 216	<hr/> 54.8

At the state level, Douglas fir (44 percent) and hemlock<sup>3</sup> (32 percent) were the dominate species consumed by the industry during 1986. In Western Washington the three major species (in order of importance) were Douglas fir, hemlock and western redcedar. Douglas fir and ponderosa pine were the major species in Eastern Washington.

Most segments of the industry use several species. However, four sectors tend to be species-specific. The post, pole and piling industry is 54 percent dependent and the veneer and plywood industry is 68 percent dependent on Douglas fir, the pulp industry's consumption of roundwood is 64 percent dependent on hemlock. The shake and shingle industry is almost exclusively dependent on western redcedar.

---

<sup>3</sup> Western hemlock and mountain hemlock have been combined under the generic designation of hemlock in this report.

Washington supplied 97 percent of the industry's log consumption. Oregon contributed 2.7 percent, with most (88 percent of this volume) consumed in the Lower Columbia area.<sup>4</sup>

## RESIDUES

### Production

The sawmill; veneer and plywood; shake and shingle; post, pole and piling; and export segments of the industry generated 5.7 million tons of wood and bark residues in 1986. Of this amount, the sawmill, and veneer and plywood sectors provided 96 percent of the total. Of their share, 98 percent was used.

Of all residues produced, 98 percent were used. Fuel use accounted for nearly 2.8 million tons (52 percent) of all residues while the pulp industry took 1.4 million tons (24 percent) of all residues.

### Use

A significant achievement of the forest products industry is the relatively high use of wood residues.

Volume use increased from 1984 to 1986.

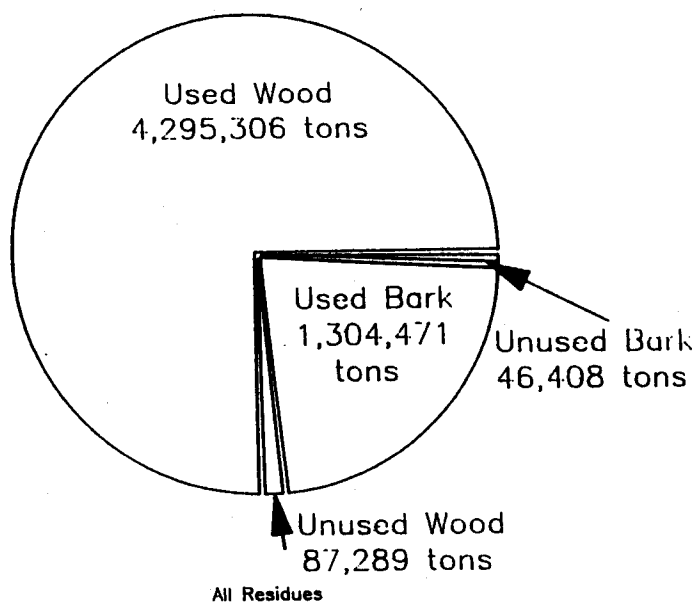
**Table 9**  
**Wood Residue Use by Industry**

<u>Wood residue use</u>	<u>Volume (Thousand tons)</u>	<u>Percent</u>
Pulp & board	1,384	24
Fuel	3,008	53
Other uses	1,208	21
Unused	134	2
<hr/>		
All wood residue	5,734	100

The relationship between wood and bark residues and the use relationship is shown graphically in Figure 5.

<sup>4</sup> Although Klickitat County lies east of the Cascades, it is included in the Lower Columbia Economic Area and is considered part of Western Washington in this report.

**Figure 5**  
**Relative and Absolute Residue Volume**



#### **HARDWOOD INDUSTRY**

Hardwood processing is another segment of the Washington wood products industry. It accounts for 4 percent of total log consumption. The hardwood species used by this industry include red alder, bigleaf maple and black cottonwood. These species are used by sawmills, veneer and plywood mills, and pulp mills. The finished products are shipped throughout the United States for use in furniture, other specialty products and pulp.

#### **MILLS USING HARDWOOD**

In 1986, 16 sawmills, 4 veneer and plywood operations, and 5 pulp mills used hardwoods. Only nine sawmills and one veneer and plywood mill used hardwoods for 90 percent-plus of their log consumption. Mills using hardwoods, with one exception, were located in Western Washington.

**Table 10**  
**Number of Mills and**  
**Dependency on Hardwood**

County	Sawmills		Veneer & Plywood		Pulp	
	Under 90%	90% +	Under 90%	90% +	Under 90%	90% +
Clallam	1	--	--	--	--	--
Clark	1	--	--	--	1	--
Cowlitz	--	2	--	--	2	--
Grays Harbor	--	--	--	--	1	--
King	1	--	--	--	--	--
Lewis	1	2	--	--	--	--
Mason	--	1	--	--	--	--
Okanogan	--	--	1	--	--	--
Pierce	1	--	1	--	1	--
Skagit	--	1	--	--	--	--
Snohomish	1	2	--	1	1	--
Walla Walla	--	1	--	--	--	--
Whatcom	1	--	1	--	--	--
Total	7	9	3	1	5	--

#### WOOD CONSUMPTION

Total hardwood log consumption was 240 million board feet in 1986 (Table D-8). Of this volume, 238 million board feet were used in milling operations; 2 million board feet went for log export. Total hardwood consumption in 1986 is slightly below 1984 consumption. In addition, 185,356 bone dry tons of hardwood chips from roundwood chipping plants were consumed by the pulp industry.

Sawmills were the primary consumer using 202 million board feet of hardwoods in 1986. This was over 7 percent of sawmills all-species consumption and was a 32 percent increase over 1984. Of this amount, 91 percent of hardwood volume consumed was by those sawmills 90 percent-plus dependent on hardwoods. Seven of these nine mills were size-class D mills. These size-class D mills consumed about 60 percent of the hardwood volume (Table D-25).

The veneer and plywood industry consumed 14.8 million board feet of hardwoods or 3.5 percent of their total log consumption (Table D-8). This was nearly 50 percent more hardwood volume than consumed in 1984.

The pulp industry used 21 million board feet of hardwood logs in 1986 (nearly 5 percent of their all-species log consumption). In addition, this industry consumed 185,355 bone dry tons of hardwood chips from roundwood chipping plants (Table D-52).

**Table 11**  
**Hardwood Consumption**

<u>Industry</u>	<u>Volume</u> (MMbf)	<u>Hardwood</u> <u>consumption</u> (Percent)
Sawmills	202	84
Pulp	21	9
Veneer & plywood	15	6
<u>Export</u>	<u>2</u>	<u>1</u>
Total industry	240	100

## HARDWOOD SUPPLY

Lewis, Snohomish and Cowlitz counties accounted for nearly half the hardwood log volume supplied to sawmills 90 percent-plus dependent upon hardwoods in 1986. These mills consumed 185 million board feet in 1986. The hardwood volume is provided primarily in Western Washington counties; over 10 percent comes from out of state.

**Table 12**  
**Hardwood Volume by County**

<u>County of origin</u>	<u>Volume</u> (MMbf)	<u>Percent</u>
Lewis	39.2	21
Snohomish	25.7	14
Cowlitz	23.1	13
Skagit	20.9	11
Pacific	20.1	11
King	9.1	5
Skamania	7.2	4
Wahkiakum	4.7	3
Clark	4.2	2
Clallam	3.2	2
Whatcom	1.4	1
Others	2.2	1
Out of state	<u>23.7</u>	<u>13</u>
Total	184.7	100

## OWNERSHIP

The hardwoods consumed by sawmills 90 percent-plus dependent on hardwoods came largely from private ownerships. Forest industry lands were the source for over two-thirds of the roundwood volume used.

**Table 13**

**Sawmill Hardwood Log Consumption:**  
**Mills 90%+ Dependent on Hardwoods**

<u>Ownership</u>	<u>Volume</u> <u>MMbf</u> (Scribner)	<u>Log</u> <u>supply</u> (Percent)
State	24.2	13
National forest	--	--
<u>Other public</u>	<u>2.5</u>	<u>1</u>
Total public	26.7	14
Forest industry		
Own wood supply	25.0	14
Other wood supply	106.5	58
<u>Farmer &amp; misc. private</u>	<u>26.5</u>	<u>14</u>
Total private	<u>158.0</u>	<u>86</u>
All owners	184.7	100

